Creating Pathways to an Inclusive STEM Workforce
We need influencers like you.
Join AAAS today.

Every important change begins with a reaction. We need educators like you to help us empower the next generation through STEM education for all. When you join AAAS, your membership helps us advocate for government funding of research, educate policymakers, and increase public awareness of the benefits of science. Get in on the reaction. Join AAAS today.

AAAS.ORG/JOINUS

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE
2019 S-STEM Symposium
Creating Pathways to an Inclusive STEM Workforce

September 12-14, 2019
Hyatt Regency on Capitol Hill

Co-hosted by
American Association for the Advancement of Science (AAAS)
Diversity, Equity, and Inclusion Programs (DEI)
and
National Science Foundation (NSF) Division of Undergraduate Education (DUE)
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Creating Pathways to an Inclusive STEM Workforce

A well-educated science, technology, engineering, and mathematics (STEM) workforce is a significant contributor to maintaining the competitiveness of the U.S. in the global economy. The National Science Foundation (NSF) Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM) program addresses the need for a high quality STEM workforce in STEM disciplines supported by the program and for the increased success of low-income academically talented students with demonstrated financial need who are pursuing associate, baccalaureate, or graduate degrees in science, technology, engineering, and mathematics (STEM).

The symposium will provide participants with an opportunity to:

- Share and learn about effective STEM undergraduate education and workforce preparation strategies;
- Disseminate best practices in STEM undergraduate education and workforce preparation ideas among colleagues and others;
- Make new connections and create collaborations;
- Promote a shared measurement system;
- Enhance communication; and
- Generate a sense of community among those seeking to expand academic opportunities for talented low-income STEM students.

The format for the symposium will include plenary sessions, discussion sessions, workshops, poster sessions, informal round tables, and structured networking sessions.
National Science Foundation (NSF) Scholarships in Science, Technology, Engineering, and Mathematics Program (S-STEM)

A well-educated science, technology, engineering, and mathematics (STEM) workforce is a significant contributor to maintaining the competitiveness of the U.S. in the global economy. The National Science Foundation (NSF) Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM) program addresses the need for a high quality STEM workforce in STEM disciplines supported by the program and for the increased success of low-income academically talented students with demonstrated financial need who are pursuing associate, baccalaureate, or graduate degrees in science, technology, engineering, and mathematics (STEM).

Recognizing that financial aid alone cannot increase retention and graduation in STEM, the program provides awards to Institutions of Higher Education (IHEs) to fund scholarships and to advance the adaptation, implementation, and study of effective evidence-based curricular and co-curricular activities that support recruitment, retention, transfer (if appropriate), student success, academic/career pathways, and graduation in STEM. The S-STEM program encourages collaborations among different types of partners: Partnerships among different types of institutions; collaborations of STEM faculty and institutional, educational, and social science researchers; and partnerships among institutions of higher education and local business and industry, if appropriate.

The program seeks:

1. To increase the number of low-income academically talented students with demonstrated financial need obtaining degrees in STEM and entering the workforce or graduate programs in STEM;
2. To improve the education of future scientists, engineers, and technicians, with a focus on academically talented low-income students; and
3. To generate knowledge to advance understanding of how factors or evidence-based curricular and co-curricular activities affect the success, retention, transfer, academic/career pathways, and graduation in STEM of low-income students.

The S-STEM Program consists of three tracks: Track 1–Institutional Capacity Building; Track 2–Design and Development: Single Institution; and Track 3–Design and Development: Multi-Institutional Consortia.
American Association for the Advancement of Science (AAAS)

The American Association for the Advancement of Science is an international non-profit organization dedicated to advancing science around the world by serving as an educator, leader, spokesperson, and professional association. In addition to organizing membership activities, AAAS publishes the journal Science, http://www.sciencemag.org/, and the Science family of journals, as well as many scientific newsletters, books and reports, and spearheads programs that raise the bar of understanding for science worldwide.

AAAS was founded in 1848 and includes some 264 affiliated societies and academies of science, serving 10 million individuals. Science has the largest paid circulation of any peer-reviewed general science journal in the world, with an estimated total readership of one million. The non-profit AAAS is open to all and fulfills its mission to “advance science and serve society” through initiatives in science policy; international programs; science education and more. For the latest research news, log onto EurekAlert!, http://www.eurekalert.org/, the premier science-news website, a service of AAAS.

Membership and Programs

Open to all, AAAS membership includes a subscription to Science. AAAS fulfills its mission to advance science and serve society through initiatives in science policy, diplomacy, education, career support, public engagement with science, and more.

AAAS Mission

AAAS seeks to “advance science, engineering, and innovation throughout the world for the benefit of all people.” To fulfill this mission, the AAAS Board has set these broad goals:

- Enhance communication among scientists, engineers, and the public;
- Promote and defend the integrity of science and its use;
- Strengthen support for the science and technology enterprise;
- Provide a voice for science on societal issues;
- Promote the responsible use of science in public policy;
- Strengthen and diversify the science and technology workforce;
- Foster education in science and technology for everyone;
- Increase public engagement with science and technology; and
- Advance international cooperation in science.

Visit the AAAS website at https://www.aaas.org/

More information on AAAS’ S-STEM related work: https://www.sstem.aaas.org
September 12, 2019

Dear Conference Participants:

On behalf of the National Science Foundation’s Directorate for Education and Human Resources, it is my great pleasure to welcome you to the 2019 S-STEM Symposium. This gathering convenes stakeholders from across the STEM higher education community, all focused on efforts to broaden participation in STEM, particularly for highly talented, low-income students from diverse backgrounds.

It is an exciting time for the S-STEM program, as you explore innovative ways to collaborate and ensure that all members of our society are provided with opportunities to engage in and pursue STEM. The theme of this year’s Symposium sets the stage for the collective work that will require the knowledge, expertise, and experience you each bring in “Creating Pathways to an Inclusive STEM Workforce.”

The mission of EHR is to provide the research foundation to develop a STEM-literate public and diverse workforce that is ready to advance the frontiers of science and engineering for society. For 13 years, S-STEM principal investigators (PI) have been a critical part of achieving that mission. You have supported student scholars in all 50 states and U.S. territories, including community colleges and four-year institutions, with a total investment of more than $120 million in fiscal year 2019. At NSF, we recognize that scholarship dollars alone are insufficient to meet our objectives; effective support of STEM scholars relies critically on impactful student services that PIs provide.

I hope that you find the plenary sessions, panel discussions, workshops, and poster sessions informative and valuable. I look forward to seeing you at the S-STEM Symposium for what will be a productive and rewarding meeting.

Sincerely,

Karen Marrongelle
Assistant Director

2415 Eisenhower Avenue | Alexandria, VA 22314
Dear S-STEM Symposium Participants:

Welcome to the 2019 S-STEM Symposium. This is the first S-STEM Symposium hosted by AAAS, the publisher of the Science family of journals, and supported by the National Science Foundation (NSF). We welcome this collaboration with NSF and applaud the Foundation’s continuing commitment to develop STEM talent from all sectors and groups in our society and to support strategies to reach underserved populations nationwide.

This year we have over 600 participants who include S-STEM PIs who lead projects supported by the NSF Education and Human Resources (EHR) Directorate – Division of Undergraduate Education (DUE), as well as others from the broader STEM education community. The format for the symposium will include plenary sessions, informal round tables, workshops, and structured networking sessions. This year’s theme focuses on Creating Pathways to an Inclusive STEM Workforce.

Our opening plenary with Sara Goldrick-Rab (Professor of Higher Education Policy and Sociology, Temple University) will set the tone for the Symposium. On Friday we will have a series of panels focused on: 1) The Future of Work with Erin White (Senior Director, STEMConnect), Wilbert Ferdinand Jr. (Retired Risk Management Advisor, ExxonMobil), Eduardo Padrón (President, Miami Dade College); and Ardine Williams (Vice President, People Operations, Amazon Worldwide Operations), 2) Student Voices with Ivan Santos (Undergraduate Student, Colorado School of Mines), Bianca Chavis (Undergraduate Student, Ivy Tech), Abigail Dorton (Undergraduate Student, University of Texas at Arlington), Nicholas DiTommaso (Undergraduate Student, Michigan State University), and Rachel Zobel (Graduate Student, University of Pennsylvania); and 3) Strategic Partnerships with Steve Bumbaugh (Senior VP, College and Career Access, College Board), Dan Greenstein (Chancellor, Pennsylvania State System of Higher Education), David Mattingly (S-STEM PI, University of New Hampshire), Eve Riskin (S-STEM PI, University of Washington), and Judy Staveley (President, Washington Academy of Sciences). We will conclude with Kamau Bobb (Senior Director, Center for Equity in Computing, Georgia Tech) who will give us a charge.

Though this Symposium is geared towards S-STEM PIs, we have provided travel awards for ~50 current and past S-STEM Scholars to attend and gain tools to best leverage their S-STEM experience. These outstanding students were nominated by their S-STEM Program Directors.

As a professional society, AAAS is working to advance science, engineering, and innovation throughout the world for the benefit of all people. We encourage all participants to visit aaas.org to find out about our grants and awards, professional development opportunities, and our Force for Science effort. It is our hope that you will expand your STEM workforce knowledge at this Symposium.

Sincerely,

Shirley M. Malcom

Iris R. Wagstaff

Shirley M. Malcom, Senior Advisor, and Director of SEA Change, AAAS

Iris R. Wagstaff, S-STEM PI and Symposium Lead, STEM Program Director, AAAS
NSF Leadership

France A. Córdova, Director
Karen Marrongelle, Assistant Director EHR
Sylvia M. James, Deputy Assistant Director EHR
Robin Wright, Division Director DUE
Lee Zia, Deputy Division Director DUE

NSF S-STEM Program Staff

Stephanie August
Jack Butler
Connie Della-Piana
Tamara Floyd Smith
Tom Higgins
Jasmine Hill
Ebony Horad
Nabriya Horton
Abby Ilumoka
Rupa Iyer
John Jackman
Andrea Johnson
Karen Keene
Jennifer Lewis
Alexandra Medina-Borja
Andrea Nixon
Mark Pauley
Pushpa Ramakrishna
Dawn Rickey
Sami Rollins
Mike Rook
Keith Sverdrup
Steve Turley
Glenda Valdez
Bev Walker
Heather Watson
Robin Wright

AAAS Leadership

Alan I. Leshner, Interim CEO and Executive Publisher, Science Family of Journals
Shirley Malcom, Senior Advisor, and Director of Sea Change
Maureen Kearney, Chief Program Officer
Se Kim, Deputy Chief Program Officer

AAAS Diversity, Equity, and Inclusion Programs (DEI)

Janaya Thompson, Director, Grant and Contract Management
Iris R. Wagstaff, S-STEM PI and Symposium Lead, STEM Program Director

AAAS S-STEM Symposium Staff

Jennifer Carinci
Tarrick Clayton
Martin Clock
Allison Gonzalez
Cassandra Jones
Laureen Summers
Janaya Thompson
Neela White

Colella Digital

Michael Colella

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David Brown, Southwestern College
Kelly Mack, Association of American Colleges and Universities
Yvette Pearson, Rice University
Ivory Toldson, Quality Education for Minorities
Kate Winter, Kate Winter Evaluation
Karen Wosczyna-Birch, CT College of Technology
ENVISIONING TOMORROW’S EARTH

The scientific endeavor has been at the forefront in developing innovations which have improved life on Earth in immeasurable ways. Now, life on this planet is facing new challenges from both nature and the built world, and scientific application is our best tool with which to react. By drawing on our current understanding of the world, and bravely experimenting with forward-thinking visions, the scientific community needs to respond with discoveries and developments to help solve many pressing problems.

Join us for the 2020 AAAS Annual Meeting in Seattle, WA!
REGISTRATION OPENS IN AUGUST

aaas.org/meetings
**AGENDA**

**WEDNESDAY, SEPTEMBER 11, 2019**

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<tr>
<td>6:00 pm - 9:00 pm</td>
<td><strong>Registration/Check-in</strong></td>
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**THURSDAY, SEPTEMBER 12, 2019**

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<th>Time</th>
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<tr>
<td>8:00 am - 4:00 pm</td>
<td><strong>Reverse Site Visit with Track 3 PIs</strong>&lt;br&gt;Concord, Lexington, and Bunker Hill</td>
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<td>3:00 pm - 8:00 pm</td>
<td><strong>Registration</strong>&lt;br&gt;<strong>Registration Foyer</strong></td>
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<td>2:30 pm - 4:00 pm</td>
<td><strong>NSF Business Meeting</strong>&lt;br&gt;Regency C/D</td>
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<td>3:00 pm - 5:00 pm</td>
<td><strong>Poster Setup for Session 1</strong>&lt;br&gt;Columbia Foyer, Regency Foyer, and Columbia B</td>
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<td>4:00 pm - 5:00 pm</td>
<td><strong>Orientation for Student Travel Awardees</strong>&lt;br&gt;Bunker Hill</td>
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<td>5:00 pm - 6:15 pm</td>
<td>**Plenary Session 1</td>
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<td><strong>Moderator: Shirley Malcom, Senior Advisor, and Director of SEA Change, AAAS</strong></td>
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<td><strong>NSF Welcome: France Córdova, Director, NSF</strong></td>
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<td><strong>AAAS Welcome: Alan I. Leshner, Interim CEO and Executive Publisher, Science Family of Journals, AAAS</strong></td>
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<td><strong>Speaker: Sara Goldrick-Rab, Professor of Higher Education Policy &amp; Sociology, Temple University</strong></td>
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<td><strong>Q &amp; A</strong></td>
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<td><strong>Announcements: Iris R. Wagstaff, S-STEM Symposium PI, STEM Program Director, AAAS</strong></td>
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**FRIDAY, SEPTEMBER 13, 2019**

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<td><strong>Registration</strong>&lt;br&gt;<strong>Registration Foyer</strong></td>
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<td><strong>Poster Setup for Session 2</strong>&lt;br&gt;Columbia Foyer, Regency Foyer, and Columbia B</td>
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<td>9:00 am - 10:00 am</td>
<td><strong>Continental Breakfast, Topical Roundtables, and Networking Session 1</strong>&lt;br&gt;Regency ABC and the Hall of Battles</td>
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<td>10:00 am - 11:15 am</td>
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<td><strong>NSF Remarks: Karen Marrongelle, Assistant Director, EHR, NSF</strong></td>
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<td><strong>AAAS Remarks: Maureen Kearney, Chief Program Officer, AAAS</strong></td>
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<td><strong>Panelists: Ardine Williams, Vice President, People Operations, Amazon Worldwide Operations</strong></td>
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<td><strong>Eduardo Padrón, President, Miami Dade College</strong></td>
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<td><strong>Wilbert Ferdinand Jr., Retired Risk Management Advisor, ExxonMobil</strong></td>
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<td><strong>Q &amp; A</strong></td>
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<td><strong>Announcements: Iris R. Wagstaff, S-STEM Symposium PI, STEM Program Director, AAAS</strong></td>
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<td>11:15 am - 11:30 am</td>
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AGENDA

11:30 am - 12:45 pm  Concurrent Workshops I Session 1
(75-minute workshops)
Workshops vary by topic.
See handout for workshop room assignments.

12:45 pm - 1:00 pm  Break

1:00 pm - 2:30 pm  Plenary Session 3 | Student Voices Panel (S-STEM Scholarship Recipients)
Working Lunch
Regency ABC

Moderator: Robin Wright, Division Director, DUE, NSF

Panelists:
Ivan Santos, Undergraduate Student, Colorado School of Mines
Nicholas DiTommaso, Undergraduate Student, Michigan State University
Abigail Derton, Undergraduate Student, University of Texas at Arlington
Bianca Chavis, Undergraduate Student, IUPUI and Ivy Tech Community College
Rachel Zobel, Graduate Student, University of Pennsylvania

Q & A

Announcements: Iris R. Wagstaff, S-STEM Symposium PI, STEM Program Director, AAAS

6:30 pm  Dinner on Your Own

SATURDAY, SEPTEMBER 14, 2019

8:30 am - 9:30 am  Continental Breakfast, Topical Roundtables, and Networking Session 2
Regency ABC and Hall of Battles

9:30 am - 10:45 am  Concurrent Workshops I Session 3
(75-minute workshops)
Workshops vary by topic.
See handout for workshop room assignments.

10:45 am - 11:00 am  Break

11:00 am - 12:00 pm  Plenary Session 5 | Closing Plenary
Keynote Speaker and Adjourn
Regency ABC
Moderator: Shirley Malcom, Senior Advisor and Director of SEA Change, AAAS

Speaker: Kamau Bobb, Senior Director, Constellations Center for Equity in Computing, Georgia Tech

Q & A

Adjournment: Iris R. Wagstaff, S-STEM Symposium PI, STEM Program Director, AAAS
Topical Roundtables
Friday, September 13, 2019 | 9:00am – 10:00am

Goal: Share evidence-based practices and resources, as well as crowd-source problem-solving, related to the topic at your chosen table.

1. Convergent Skills Development Across STEM Disciplines
2. Culturally Relevant Pedagogy (engaging with undergraduate students)
3. Student Engagement Strategies
4. Strategies for Tracking Program Graduates
5. Networked Improvement Communities
6. Program Improvement
7. Tackling Bias from Classmates
8. Transfer Students: Challenges and How to Overcome Them
9. Retention of Low-income Minority Students in a Majority School
10. Establishing a STEM Community

Topical Roundtables
Saturday, September 14, 2019 | 8:30am – 9:30am

Goal: Share evidenced-based practices and resources, as well as crowd-source problem-solving, related to the topic at your chosen table.

1. Internships and Apprenticeships
2. Undergraduate Research Experiences
3. Supporting First Generation Students
4. Strategic Collaborations and Partnerships
5. Skills for Advanced Manufacturing and the Future of Work
6. Beyond Transfer Issues
7. Dissemination Strategies
8. Evaluation of the S-STEM Program
9. Industry and National Labs Partnerships for Graduate Students
10. Understanding Workforce Needs for Today and for the Future
HOTEL FLOOR PLANS

Lobby Level
Session 1: Friday, September 13\textsuperscript{th}  
11:30am - 12:45pm

1.1 Addressing Two S-STEM Program Requirements: Research and Evaluation

*Session Length: 75 Minutes*

Connie Kubo Della-Piana, Program Director, Division of Undergraduate Education, NSF; Jennifer Lewis, Program Director, Division of Undergraduate Education, NSF

Target Audience: Evaluators/Education and Discipline-Based Education Researchers; Principal and Co-Principal Investigators, STEM Faculty and other Staff, Higher Education Institution Administrators, and others considering submitting a proposal to the S-STEM Program

Topic: Evaluation

Through short presentations and audience discussions, this session will provide participants with an overview of education evaluation and research that informs project improvement and knowledge generation. This session will focus on two program requirements:

1. Evaluation of project efforts to address financial need and provide systems of academic and student supports; and
2. Research on factors associated with student success, retention, transfer and graduation in STEM.

The session will emphasize the use of information from project evaluation and research to inform project improvement and to document progress, impact, and accomplishments as required by the S-STEM program survey, project annual and final reports, and the project outcomes report.

1.2 Birds of a Feather: Recruitment, Persistence, and the Future of S-STEM Scholars

*Session Length: 75 Minutes*

Stephanie August, Program Director, NSF

Target Audience: Principal and Co-Principal Investigators, STEM Faculty and other Staff, Higher Education Institution Administrators, and others considering submitting a proposal to the S-STEM Program

This Birds of a Feather discussion focuses on effective recruitment of scholars, the factors that most influence scholars' persistence, and how visions of the future of STEM education influence the PIs' strategies for preparing students for their futures. Identifying a pool of low-income, academically talented students that is large enough to yield the target number of scholars often presents a challenge to S-STEM programs. Enticing scholars to engage fully in S-STEM activities designed to help them persist without requiring their participation requires creativity. Preparing the scholars for a future that we know will be different can be perplexing when we aren't sure ourselves what that future will be like. This session is an opportunity to network and problem solve with peers who are experiencing and overcoming similar challenges on their S-STEM projects.

1.3 Community College Meet-Up

*Session Length: 75 Minutes*

Tom Higgins, Program Director, NSF; Glenda Valdez, Science Assistant/Science Education Analyst, NSF

Target Audience: Two-year College Faculty, Staff, Administrators, and Collaborators

Topic: Two-year Colleges

This Meet Up brings people together to talk about community college students and share effective practices for supporting these students in the context of the S-STEM program. This is an opportunity for people to share ideas, teaching techniques, and problems encountered and solved. Success in connecting with students in the context of the two-year colleges and institutions to which they transfer will be at the forefront of this conversation. Let's share what we have learned.

1.4 Creating a Clear Path: Translational Developmental Science in Action

*Session Length: 75 Minutes*

Bonnie Green, Professor of Psychology, East Stroudsburg University; Olivia M. Carducci, East Stroudsburg University; T. Michelle Jones-Wilson, East Stroudsburg University; John Darsinos, East Stroudsburg University

Target Audience: First Year Awardees, Evaluators/Education Researchers, Higher Education Administrators, Principal Investigators, Awards Managers / SROs, Faculty Mentors, Education or Social Science Researchers, Aspiring S-STEM proposers

Topic: Grant Management

We all have experiences with student success committees. Initiatives are often driven by someone who attended a workshop or meeting about the latest advance in student success: flipped classroom, high impact practices, social and emotional learning, or the latest trauma informed teaching. When the committee decides to encourage a particular practice, the mechanism is sometimes vague. There is some discussion of
goals, but no real assessment plan. Often the committee is disbanded before graduation rates or other measures are available.

Why this workshop on Translational Developmental Science? Our students do not have the time for us to flounder, uncommittedly vacillating between approaches and hoping for positive results. When a program works, we need to understand what programmatic elements are responsible for student success. Such understanding will enable our work to be scalable and transferable to other institutions.

This workshop focuses on tackling STEM student success like the scientists we are. Borrowing from the discipline of Translational Medicine, this workshop will introduce the concept of Translational Developmental Science (TDS). In TDS, questions start in the classroom, but answers are found from lab work. Research moves from the laboratory to the classroom and back to the laboratory. We will discuss how TDS has been used in East Stroudsburg University’s Clear Path S-STEM Program to facilitate student success.

This session will benefit Principal Investigators, Administrators and Educational Researchers. Those aspiring to these positions who are interested in learning how to create, implement and effectively assess theory driven programs to improve STEM student success should attend.

1.5 Designing Culturally Relevant Practices in our S-STEM Program

Session Length: 75 Minutes

Ileana Vasu, Professor, Holyoke Community College

Target Audience: First Year Awardees, Evaluators/Education Researchers, Higher Education Administrators, Principal Investigators, Education or Social Science Researchers, Aspiring S-STEM proposers

Topic: Student Experiences for Students

There are many ingredients leading to a successful S-STEM programs. This workshop is designed for those interested in broadening the participation of underrepresented groups in your STEM discipline and S-STEM program by including a culturally relevant or inclusive focus to their program. By the year 2020, 45% of high school graduates in the United States will be minority students. By 2050, the United States will become a majority-minority nation. When looking at high school students, it is projected that the number of white high school graduates will decline in the next 10-20 years and the number of high school graduates of color will rise (Bransberger & Michelau, 2016). As our NSF programs are striving to diversify STEM, our programs need to identify and support culturally relevant practices.

1.6 Division of Grants and Agreements: Post Award Financial Management

Session Length: 75 Minutes

Rashawn Farrior, Team Lead, NSF

Target Audience: College Faculty, Staff, Administrators, and Collaborators

Topic: Grant Management

Each NSF-funded project has an assigned Grants Officer in the Division of Grants and Agreements in addition to the cognizant Program Officer. This session will focus on post-award management requirements and actions from the perspective of the NSF Grants Officer. Topics will include: 1) Award Administration Roles of Grantees and Grants Officers, 2) Award Notifications and Requirements, 3) Proposal Review and Award Management, 4) Advanced Monitoring and Business Assistance Program, and 5) Resources and Pathways to Success. Learn more about the ins and outs of annual reports, allowable and unallowable expenses, participant support, sub-award monitoring, award changes that require NSF notification and or approval, and advanced monitoring site visits.

1.7 Impact the Community!!!: Service Learning and Group Projects in an S-STEM context

Session Length: 75 Minutes

LeAnn Faidley, Associate Professor of Engineering, Wartburg College; Christine DeVries, Wartburg College

Target Audience: First Year Awardees, Principal Investigators, Faculty Mentors, Aspiring S-STEM proposers

Topic: Student Experiences for Faculty Mentors

This workshop is aimed at those participants working directly with students, especially those looking to engage students in high-impact practices that have been shown to increase retention. It will describe the implementation of STEM service projects and guide attendees through specific tools used to address common challenges. The service projects implemented in our S-STEM grant program incorporate STEM as part of students’ whole life, not just their academic pursuits. These projects provide real-life opportunities to apply STEM skills, motivate students in their academic endeavors, provide a broader impact to the local community, and create connections within their S-STEM cohort as well as the local community. The workshop will guide participants in the process necessary to assist students in the creation and implementation of STEM service projects.
High-achieving students like those in S-STEM programs struggle when working within a group structure. They often have had negative experiences with group assignments where they feel that they were responsible for more than a fair share of the completed work. With a long term, co-curricular service project, no individual student has the necessary skills to complete the project alone, and must work with a set of colleagues in order to meet their goals. These complex projects provide the motivation for these high-achieving students to develop group skills, but faculty are not typically trained in how to facilitate group structures. The workshop will provide brief training with tools to address these challenges.

1.8 Mindset, Knowledge and Ability for Innovation and Entrepreneurship in Technology

Session Length: 75 Minutes

Jacob Tsao; College of Engineering, San Jose State University; Ahmed Hambaba; College of Engineering, San Jose State University

Target Audience: Higher Education Administrators, Education or Social Science Researchers
Topic: Student Experiences for Faculty Mentors

Innovation and entrepreneurship in technology is required not only for continued economic leadership of the US but also for economic growth and environmental sustainability of the world. While entrepreneurship has been researched for a long time and taught widely in business schools, innovation research and education in technology has not matured in engineering education. As educators and researchers, how we cultivate mindset, impart knowledge and develop ability for such innovation in a most effective and efficient way are critically important. In this workshop, the presenter will report his experience in developing and executing the Silicon Valley Innovation and Entrepreneurship Scholarship (SVIES) Program and then facilitate discussion among the workshop participants in the hope of arriving at a set of best practices for innovation research and education.

An innovation is a dynamic process; the process advances a technological area from an inferior prior state to a superior posterior state. A detailed study of this process is an innovation history, e.g., what exactly existed before the innovation, what the innovator knew and saw, what the posterior state exactly was, why the innovator saw it while other did not, etc. A major hypothesis of the presenter is that any serious effort in developing either theories or best practices of innovation and entrepreneurship must include and even start with development of ‘innovation histories’, so that commonalities from successes and failures of past pursuits of innovation and entrepreneurship can be extracted. Other hypotheses of the presenter will also be discussed.

1.9 Office Hours with NSF Program Officers

Session Length: 75 Minutes

NSF S-STEM Program Officers

Target Audience: First Year Awardees, Principal Investigators, Faculty Mentors, Aspiring S-STEM proposers
Topic: Opportunity to ask any questions

Office hours will provide an opportunity for PIs, active and potential, to talk one-on-one with a program officer about their projects or ideas for a project.

1.10 S-STEM Monitoring (ICF) Data Collection Office Hours

Joseph Asare, Data Collection Assistant, NSF; Patrick Higgins, Assistant Project Manager, NSF

Session Length: 75 Minutes

Target Audience: All Active PIs

Office hours are open to all S-STEM PIs and project members supporting the reporting effort. ICF administers the online S-STEM program monitoring data collection, which is separate from the Annual Report submitted through Research.gov. ICF provides technical support throughout the data collection cycle via email and phone, but staff are available to speak in person with PIs and support staff to address questions regarding this reporting effort.

Session 2: Friday, September 13th 4:00pm - 5:00pm

2.1 Addressing Two S-STEM Program Requirements: Research and Evaluation

Session Length: 60 Minutes

Connie Kubo Della-Piana, Program Officer, NSF; Jennifer Lewis, Program Director, Division of Undergraduate Education, NSF

Target Audience: Evaluators/Education and Discipline-Based Education Researchers; Principal and Co-Principal Investigators, STEM Faculty and other Staff, Higher Education Institution Administrators, and others considering submitting a proposal to the S-STEM Program
Topic: Research and Evaluation

Through short presentations and audience discussions, this session will provide participants with an overview of education
evaluation and research that informs project improvement and knowledge generation. This session will focus on two program requirements:

1. Evaluation of project efforts to address financial need and provide systems of academic and student supports; and
2. Research on factors associated with student success, retention, transfer and graduation in STEM.

The session will emphasize the use of information from project evaluation and research to inform project improvement and to document progress, impact, and accomplishments as required by the S-STEM program survey, project annual and final reports, and the project outcomes report.

2.2 Building Institutional Partnerships to Enhance Diversity and Inclusion in the Research Workforce

Session Length: 60 Minutes

Chloe Poston, Associate Director, The Leadership Alliance

Target Audience: Higher Education Administrators, Awards Managers / SROs, Faculty Mentors
Topic: Partnerships and Collaborations

The Leadership Alliance is a national consortium of teaching and research intensive colleges and universities that work together with the goal of diversifying the research workforce. This session will share best practices for identifying institutional partners, developing long-term relationships, and leveraging resources to support students from underrepresented backgrounds.

The following workshops are 30-minute workshops, sharing the same breakout room during Session 2:

2.3a: 4:00pm - 4:30pm

2.3a Designing Co-Curricular Engagements that Students Actually Attend

Session Length: 30 Minutes

Keith Hubbard, Professor of Mathematics, Stephen F. Austin State University

Target Audience: First Year Awardees, Principal Investigators, Faculty Mentors, Education or Social Science Researchers, Aspiring S-STEM proposers
Topic: Student Experiences for Faculty Mentors

This workshop is designed for those beginning an S-STEM or looking to improve engagement through effective co-curricular activity design. Offering great STEM fieldtrips, clubs, research opportunities, etc. can be quite challenging. But what can be even more challenging is when activities are offered yet only a fraction of scholars actually participate. Our program’s gap seems to have been less in creating and communicating high-value engagements, but rather in developing interpersonal STEM relationships that push scholars into co-curricular engagements. Other programs may encounter similar relational challenges.

Session 2:3b: 4:30pm - 5:00pm

2.3b Helping STEM Scholars Be Successful in Their First Year: Perspectives in Student Programming and Interventions

Session Length: 30 Minutes

Laura MacDonald, Assistant Professor of Biology, Hendrix College

Target Audience: First Year Awardees, Evaluators/Education Researchers, Higher Education Administrators, Principal Investigators, Faculty Mentors, Education or Social Science Researchers, Aspiring S-STEM proposers
Topic: Student Experiences for Faculty Mentors

The target demographic of students receiving scholarships from an NSF S-STEM grant are those from socioeconomically disadvantaged backgrounds, many of whom face additional challenges through stereotype threat, difficult family backgrounds, limited support systems as a result of their financial circumstances. Likewise, many institutions find that these students are most at risk for failing to complete a college education in the first two years of study, suggesting this timeframe is most crucial for the implementation of interventions that support student success. In this session, I will briefly present an overview of strategies to be implemented as programming initiatives for students early in their career (freshmen and sophomore level). Topics that will be covered include mentor perspective taking, strategic advising, cohort building strategies, and the use and implementation of psychological interventions.

2.4 Division of Grants and Agreements: Post Award Financial Management

Session Length: 60 Minutes

Rashawn Farrior, Team Lead, National Science Foundation

Target Audience: College Faculty, Staff, Administrators, and Collaborators
Topic: Grant Management
Each NSF-funded project has an assigned Grants Officer in the Division of Grants and Agreements in addition to the cognizant Program Officer. The presenter will discuss post-award management requirements and actions from the perspective of the NSF Grants Officer. Topics will include: 1) Award Administration Roles of Grantees and Grants Officers, 2) Award Notifications and Requirements, 3) Proposal Review and Award Management, 4) Advanced Monitoring and Business Assistance Program, and 5) Resources and Pathways to Success. Learn more about the ins and outs of annual reports, allowable and unallowable expenses, participant support, sub-award monitoring, award changes that require NSF notification and or approval, and advanced monitoring site visits.

2.5 Evaluating S-STEM Grants Using a Culturally-Responsive Framework

Session Length: 60 Minutes
Kavita Mittapalli, Evaluator, MN Associates Inc

Target Audience: First Year Awardees, Evaluators/Education Researchers, Higher Education Administrators, Principal Investigators, Education or Social Science Researchers, Aspiring S-STEM proposers
Topic: Critical Role of Community Colleges in the STEM Landscape

Every S-STEM project requires separate research and evaluation components that are uniquely different from each other while also being joined/aligned in some ways. Research and evaluation serve different purposes (knowledge generation vs. program improvement) but come together to share methods and analysis. They diverge again in their findings and outcomes. As evaluators of two current S-STEM projects and education researchers on several other NSF and federally-funded grants across the US, MN Associate is working towards incorporating a more participatory, inclusive, and culturally-responsive research and evaluation framework as posited by scholars Frierson, Hood, Hughes, and Thomas (2010) and Hood, Hopson, & Kirkhart (2015). Culturally Relevant and Responsive Education (CRRE) is a holistic framework for centering research/evaluation in a culture that recognizes that culturally defined values and beliefs lie at the heart of any work. CRRE facilitates deeper conversations, engagement, learning, and real-time continuous development and feedback for data collection, analyses, and reporting that allows open dialogue and improvement. CRRE gives attention to groups that have been historically marginalized and underserved, seeking to bring balance and equity into the research and evaluation processes (Hopson, 2009). The 60-minute session will engage the audience in two ways. First, a slide presentation will provide a context and an overview of the differences between research and evaluation, followed by definition and usage of CRRE principles in S-STEM projects for conducting evaluation work. Secondly, the audience will be engaged in 2-3 discussion questions related to their projects and how they are working with their researchers/evaluators to conduct a more inclusive CRRE work. Finally, a share out of lessons learned, any emerging good practices using CRRE, and a general Q and A will be completed to wrap-up the session.

2.6 Job Crafting: A Low-Cost Method to Create and Sustain Meaning in STEM Careers

Session Length: 60 Minutes
Brandi Shanata, S-STEM Scholar Program Manager, Cornell College

Target Audience: Undergraduate and/or Graduate Students, Principal Investigators, Awards Managers / SROs, Faculty Mentors, Education or Social Science Researchers, Aspiring S-STEM proposers
Topic: Student Experiences for Faculty Mentors

Anyone who mentors undergraduates (faculty, program managers, etc.) would benefit from this low-cost way to empower and engage students in crafting their own future. According to the 2019 Bates College and Gallup report “Forging Pathways to Purposeful Work: The Role of Higher Education” there is a shift in how college graduates view their work. Eight out of ten said it is very important to derive a sense of purpose from their work. Those graduates who report high purpose in their work are almost ten times more likely to have a high overall wellbeing. Yet less than half of graduates report finding desired purpose in their work. This is potentially at odds with the backgrounds of low-income students in the NSF S-STEM program; most of our cohort viewed college as primarily a way to greater financial security through a career in STEM. College may be the first time they are exposed to the possibility of a job that goes beyond family income—it provides purpose. Our students who have faced financial instability are more likely to see a dichotomous choice: financial success or happiness. It is not a dichotomous choice and by introducing the concept of job crafting, through a guided activity and intentional mentoring, we utilize concrete, low-cost methods to address this growing need. By making this small change at this point in the STEM pipeline we hope to move our students into the half of graduates who find purpose in their work and increase the likelihood of overall wellbeing.

2.7 New PI Session—What You Want to Know!

Session Length: 75 Minutes
Karen Keene, Program Director, NSF

Target Audience: New-to-S-STEM Principal Investigators and co-Principal Investigators
2.10 S-STEM 4-year/2-year School Partnerships: Lessons Learned

Session Length: 60 Minutes

Christopher Kvaal, St. Cloud State University; Jennifer Evens, St. Cloud Technical and Community College; Shawn Mueske, Ridgewater Community College; William Saari, Anoka Ramsey Community College

Target Audience: Higher Education Administrators, Principal Investigators, Aspiring S-STEM proposers

Topic: Partnerships and Collaborations

This workshop will be of most value to aspiring S-STEM proposers, current PIs, and Higher Education administrators. It will focus on key lessons learned in the 4-year to 2-year school partnership S-STEM model. The ACCESS STEM (Track 3 - Design and Development: Multi-Institutional Consortia) project was conceived in central Minnesota at Saint Cloud State University (SCSU) in 2015. The PI team searched best practices in crafting and authoring ACCESS STEM. Guided by past data, 4 two-year schools were recruited with the highest transfer rate to SCSU: Anoka Ramsey Community College, Ridgewater Community College, North Hennepin Community and Technical College, and St. Cloud Community and Technical College. We established administrative and faculty leads at each institution, assembled necessary demographics and financial aide data, and were funded on resubmission in January of 2018. As of this writing, Cohort 1 has finished one year, and we are nearly complete recruiting Cohort 2. To date, we have met our primary benchmarks set in our proposal. This workshop will address lessons learned in the differences of operation between the 4-year/2-year schools in the areas of 1) calculation of cost of attendance, 2) recruiting timelines, 3) difficulty in obtaining complete applications, 4) eligibility, 5) declining enrollment, and 6) administrative turnover.

Session 3: Saturday, September 14th
9:30am - 10:45am

3.1 A Strategic Approach to the Preparation of Competitive S-STEM Proposals

Session Length: 75 Minutes

John Krupczak, Professor of Engineering, Hope College; David R. Brown, Foundation for California Community Colleges

Target Audience: Evaluators/Education Researchers, Principal Investigators, Aspiring S-STEM proposers

Topic: Grant Management
The NSF S-STEM program provides both monetary scholarships and comprehensive support services to talented STEM majors with demonstrated financial needs, with the ultimate goal of assisting them to complete STEM degrees. As a consequence of the many levels of potential support for S-STEM scholars and perfunctory content of all NSF proposals, guidance and requirements found in the current NSF Proposal and Award Policies and Procedures Guide (PAPPG, NSF 19-1) and the current NSF S-STEM Program Solicitation (NSF 17-527) comprise a significantly lengthy list. This can pose substantial challenges to drafting a coherent, thorough and compelling argument for support via a 15-page narrative. An approach for acquiring essential content for S-STEM proposals related to the archetypes of potential S-STEM scholars was developed, in part, based on the NSF I-Corps for Learning (I-Corps L) model. Furthermore, other strategies for streamlining the acquisition and organization of critical elements of competitive S-STEM proposals have been established and will be shared along with the I-Corps L approach.

The following workshops are 35-minute workshops, sharing the same breakout room during Session 3:

3.2a: 9:30am - 10:05am

3.2a An Interactive Workshop on Increasing Enrollment and Targeting Support to First-Generation Students

Session Length: 35 Minutes

Sally Wasileski, University of North Carolina Asheville

Target Audience: First Year Awardsees, Principal Investigators, Aspiring S-STEM proposers

Topic: Student Experiences for Faculty Mentors

Through funding from three successive NSF S-STEM grants in 2011, 2015 and 2019, the Department of Chemistry at the University of North Carolina Asheville created the Chemistry Scholars Program, which provides scholarships for some chemistry majors with academic talent and financial need and provides educational support programs inclusive of all chemistry majors. The evolution of the focus of the program over the three awards has been significant in transforming department culture, creating a student-engaged curriculum, and leading to a now 300% increase in the number of chemistry graduates since program inception. The evolution of focus began with (1) building capacity to increase the number of chemistry graduates through programmatic components to increase recruitment and retention. After building capacity, our S-STEM program evolved to (2) focusing on better supporting the specific needs of the student body that we were now attracting, which was composed of a significant proportion of low-income first-generation students, and to (3) expanding the student support further from Tinto’s model of academic support and social integration to a more holistic system that includes emotional support with a partnership with Student Affairs and a research component to investigate the impact of a holistic support program. This session will benefit new, current and future PIs interested in evolving their S-STEM program to seek additional grants, capacity building and targeting student support to first-generation students.

3.2b: 10:10am - 10:45am

3.2b S-STEM Track III Project Formation: Fostering Synergistic Partnerships and Collaborations

Session Length: 35 Minutes

Joseph Flaherty, Coker University; Anthony Canger, Mercy College

Target Audience: Higher Education Administrators, Faculty Mentors, Aspiring S-STEM proposers

Topic: Partnerships and Collaborations

This 30-minute workshop will benefit multiple types of audience members including aspiring proposers and faculty mentors, in addition to higher education administrators. Our focus will be centered on the formation of a consortium of four small, private, under-resourced institutions that serve a high proportion of low-income students and their development of a Track III S-STEM project. Aspiring proposers and higher education administrators will benefit from activities designed to identify and cultivate synergistic partners and facilitate the development of effective research questions. In the case study presented, the institutions developed a synergistic mix of activities (e.g. early engagement in undergraduate research, intrusive advising, professional mentoring) all of which have been shown to improve persistence in STEM majors. All participants will benefit from the sharing of specific student-centered activities and results obtained after the first year of our collaborative project.

3.3 Cal-Bridge: A Multi-institutional Partnership Engaging Underrepresented Students in STEM

Session Length: 75 Minutes

Alexander L. Rudolph, Cal Poly Pomona and Cal-Bridge

Target Audience: Higher Education Administrators, Undergraduate and/or Graduate Students, Principal Investigators, Faculty Mentors, Education or Social Science Researchers, Aspiring S-STEM proposers

Topic: Partnerships and Collaborations
This workshop will describe Cal-Bridge, a California-wide, multi-institutional program, and a partnership of 25 4-year universities and over 30 community colleges from all three levels of the California higher education system. Details relating to the set up and operation of the partnership, mentoring best practices, and information about mentoring and supporting students traditionally underrepresented in STEM will be discussed. In addition, we will review research into the barriers to diversity in STEM.

This workshop will benefit those who want to know:

1. How to successfully set up multi-institutional partnerships,
2. What are the best mentoring practices for underrepresented groups, and
3. What are the barriers to advancement in STEM of students from underrepresented groups.

### 3.4 Designing and Implementing Student-Driven Course-Based Undergraduate Research Experiences (CUREs)

**Session Length: 75 Minutes**

Gina M. Florio, St. John’s University; Alison Hyslop, St. John’s University; Gen Long, St. John’s University

Target Audience: Evaluators/Education Researchers, Higher Education Administrators, Principal Investigators, Faculty Mentors, Education or Social Science Researchers, Aspiring S-STEM proposers

Topic: Student Experiences for Faculty Mentors

In this workshop, we will discuss the value of course-based undergraduate research experiences (CUREs) and describe the innovative model we have developed and implemented through our NSF S-STEM award. Through this session, we will promote adoption of CUREs as a means to broaden participation of the number and types of undergraduate students engaged in authentic research experiences. We will discuss how to create student-driven CUREs that emphasize both the process and products of science. This workshop will benefit faculty and administrators who are interested in broadening participation and scaling-up undergraduate research programs.

Our “Solving the Big Problem” CURE brings together a multidisciplinary cohort of second-year STEM students to work in teams to design, develop, and carry out their own research projects focused on a central theme, a big problem, of societal importance. Our approach centers the whole experience on the student researchers. The course serves to provide early research experience and robust disciplinary mentorship in order to improve student outcomes, e.g., increased persistence to degree completion, participation by traditionally under-represented and marginalized student populations, and enhanced self-concept as a scientist. Undergraduate research is a well-established high-impact educational practice and CUREs provide an effective mechanism to bring research to scale. This CURE can be adapted for use in any discipline, institution type, and with the resources that are available.

### 3.5 Development of an Interdisciplinary Faculty Learning Communities to Building Faculty Community and Capacity to Support the Success of ALL STEM Students

**Session Length: 75 Minutes**

Louis Liotta, Stonehill College; Rachel Hirst, Stonehill College; Pamela Lombardi, Stonehill College; Guiru Gu, Stonehill College

Target Audience: First Year Awardees, Higher Education Administrators, Principal Investigators, Faculty Mentors, Education or Social Science Researchers, Aspiring S-STEM proposers

Topic: Student Experiences for Faculty Mentors

Faculty unaware of the diverse challenges faced by students can create an environment that discourages the persistence of minoritized groups (Johnson, 2007; Reyes, 2011; Carlone and Johnson, 2007; Seymour, Hewitt, and Friend, 1997). Students nationally detail instances of feeling undervalued, underestimated, and discouraged from persisting by interactions with faculty. While much is known about the barriers that students face, less is known about effective ways to generate the kinds of nuanced educational reform that can impact the most diverse student populations. One area of promising research pertains to faculty learning communities (FLCs), as it has been shown that long-term investments in faculty learning and support help faculty develop new pedagogical strategies (Henderson, Beach, and Finkelstein, 2011).

A STEM FLC was developed to build faculty capacity for supporting and retaining students. The goals of the FLC included: 1) learning about the barriers students face, 2) developing a community of faculty with a common goal of supporting ALL science students, and 3) building faculty capacity around inclusive advising, mentoring, and teaching. Faculty participants met five times each semester to discuss readings pertaining to best-practices in STEM mentoring, advising and teaching. Case studies based on difficult conversations or scenarios faculty had encountered in their interactions with students were examined. Several actionable items were identified during FLC discussions, and faculty participants worked to implement these initiatives to increase students’ belongingness, capacity, and interest with a focus on underrepresented students, first-year science students, first-generation students, and community college transfer students.
3.6 Development of Sustainable Undergraduate STEM Research Programs at Community Colleges

Session Length: 75 Minutes

Dan Dimitriu, Engineering Program Coordinator, San Antonio College

Target Audience: First Year Awardees, Evaluators/Education Researchers, Higher Education Administrators, Undergraduate and/or Graduate Students, Principal Investigators, Awards Managers / SROs, Faculty Mentors, Education or Social Science Researchers, Aspiring S-STEM proposers

Topic: Critical Role of Community Colleges in the STEM Landscape

Since 2010, San Antonio College has been the center of a continuously increasing family of STEM-related undergraduate research projects hosted by Texas’ first Math, Engineering, and Science Achievement (MESA) Center. Several papers presented at various ASEE Conferences described the start and the evolution of this program at our community college. It has been widely reported that undergraduate research programs at four-year institutions increase retention, improve students’ success, and produce higher quality graduates. Our results demonstrate that two-year institutions can also initiate and maintain successful undergraduate research programs. The workshop will present a proven plan describing the benefits and limitations of such an endeavor and offer advice to help other community colleges to develop a sustainable STEM undergraduate research program on their premises.

3.7 Incorporating Undergraduate Research Into Your S-STEM Program

Session Length: 75 Minutes

Dennis Ugolini, Trinity University

Target Audience: Principal Investigators

Topic: Workforce Preparation for the Future of Work and Degree Completion

This workshop is for PIs looking to propose a new S-STEM program or expand the functionality of an already existing one, incorporating undergraduate research. The workshop will combine small group brainstorming with the lessons learned over five years of the FASTER (Financial Aid for Science and Technology students, Enhanced with Research) program at Trinity University, to address:

1. How to structure your research component to give maximum value to students (pre- and post- internship programming, mixers with potential mentors, responsible conduct of research training)

2. What students should be getting out of research (and what they’ve reported to us as their biggest gains in the FASTER program)

3. How your institution can benefit from supported research (recruitment, taking the risk out of faculty accepting first-time researchers, starting long-term relationships between student and mentor)

This workshop addresses the 'Undergraduate research experiences' sub-theme of the 'Workforce Preparation' topic.

3.8 January Workshop to Prepare Students for Second Semester First-Year Biology At Ursinus College

Session Length: 75 Minutes

Kathryn Goddard, Ursinus College

Target Audience: First Year Awardees, Higher Education Administrators, Principal Investigators, Awards Managers / SROs, Faculty Mentors, Education or Social Science Researchers, Aspiring S-STEM proposers

Topic: Student Experiences for Faculty Mentors

At this workshop I will present a program that benefits first-year biology students and could be adapted for any scientific discipline. It has been offered only to S-STEM scholarship recipients in the past three years at Ursinus College. In 2020 it will be open to other students who would appear to gain the most from the program. It benefits students who would gain from additional preparation for the second semester such as students who did not score well in the first semester, students who were underprepared by their high school, students who would like additional career guidance, and students who want to learn laboratory skills that will help them to be leaders in the laboratory component of the course. The program is a January four-day workshop to prepare students for the second semester of first-year biology. This workshop may be of interest to any faculty member who might be interested in introducing a similar program at their institution. Interested faculty might include aspiring S-STEM proposers, current PIs, higher education administrators, education or social science researchers, and first-year awardees.

3.9 Scholar Networking and STEM Career Paths

Beverly Walker, Science Assistant, NSF; Glenda Valdez, Science Assistant, NSF

Session Length: 75 Minutes

Audience: Current and Past S-STEM Scholars

This session for S-STEM Scholars centers on the power of networking and how it can contribute to your unique STEM
career path. Tips and tricks to network like a pro will be put to use before the end of the session! How can we leverage our networks to pursue successful and fulfilling careers? What sorts of platforms exist to build one’s network? Questions like these and more will be covered. Additionally, presenters will lead a discussion on diverse STEM career paths sharing some of their own experiences.

The following workshops are 35-minute workshops, sharing the same breakout room during Session 3:

3.10a: 9:30am - 10:05am

3.10a Sharing the Experience of San Antonio Mathematics Scholars Program at the University of the Incarnate Word

Session Length: 35 Minutes

Suleyman Tek, University of the Incarnate Word

Target Audience: Principal Investigators

Topic: Student Experiences for Faculty Mentors

This workshop will present information about the S-STEM Mathematics Scholars Program at the University of the Incarnate Word. Current Principal Investigators (PI) and future PIs would benefit and might get some ideas from our experiences.

3.10b: 10:10am - 10:45am

3.10b Supporting Student Success and Increasing Diversity in Computer Science

Session Length: 35 Minutes

Turgay Korkmaz, University of Texas at San Antonio

Target Audience: First Year Awardees, Undergraduate and/or Graduate Students, Principal Investigators, Faculty Mentors, Education or Social Science Researchers, Aspiring S-STEM proposers

Topic: Student Experiences for Students

This workshop will share first-year experiences in managing an NSF S-STEM grant and demonstrate what works for the students to be successful.

3.11 Uncorking Curricular Bottlenecks to Diversity, Inclusion and Student Success in STEM

Session Length: 75 Minutes

Nathan Klingbeil, Wright State University

Target Audience: Evaluators/Education Researchers, Higher Education Administrators, Undergraduate and/or Graduate Students, Principal Investigators, Faculty Mentors, Education or Social Science Researchers, Aspiring S-STEM proposers

Topic: Student Experiences for Faculty Mentors

This workshop will describe an NSF-funded curricular reform initiative at Wright State University (WSU) to redefine the way engineering mathematics is taught, with the goal of increasing student retention, motivation and success in engineering. It will include a data-driven, longitudinal analysis of program impacts on student performance, perception and retention, and how those impacts disproportionately benefit the success of underrepresented students (women and minorities). The development, assessment and national dissemination of the WSU model for engineering and mathematics education has been supported by NSF STEP Type 1, CCLI Phase 3, TUES Type 3 and S-STEM awards and has resulted in the participation of dozens of collaborating institutions nationwide. Since its inception in Fall of 2004, the program has had an overwhelming impact on engineering student success and degree attainment at WSU, with a disproportionate impact on members of under-represented groups. Longitudinal impacts have been widely reported in American Society for Engineering Education and other conference publications and have been featured in invited presentations and workshops hosted by the national student success and professional development organizations Complete College America and Academic Impressions.

The intended audience includes faculty, staff and administration who seek to increase student success and degree attainment in STEM disciplines. Those having institutional responsibility for curricular reform, student affairs and/or diversity and inclusion programming are strongly encouraged to attend, as are those seeking to increase institutional attainment of state performance funding metrics and other enrollment management goals.
NSF Leadership

France A. Córdova, Director, National Science Foundation

The Honorable France A. Córdova is an astrophysicist and the 14th director of the National Science Foundation (NSF). Córdova was nominated to this position by the President of the United States in 2013 and subsequently confirmed by the U.S. Senate. NSF is a $8.1B independent federal agency; it is the only government agency charged with advancing all fields of scientific discovery, technological innovation, and STEM education.

Córdova has been a leader in science, engineering and education for more than three decades. She has a distinguished career in both higher education and government; her contributions in multi-spectrum research on x-ray and gamma ray sources and space-borne instrumentation have made her an internationally recognized astrophysicist. She is president emerita of Purdue University, chancellor emerita of the University of California, Riverside and former vice chancellor for research at the University of California, Santa Barbara. She also served as NASA’s chief scientist and is a recipient of the agency’s highest honor, the Distinguished Service Medal. Prior to joining NASA, Córdova was the astronomy department head at Penn State and deputy group leader at Los Alamos National Lab.

She received her BA from Stanford University and her PhD in physics from the California Institute of Technology.

Karen Marrongelle, Assistant Director, NSF EHR

Karen Marrongelle is the Assistant Director of the National Science Foundation (NSF) for Education and Human Resources (EHR). She leads the EHR directorate in supporting research that enhances learning and teaching to achieve excellence in U.S. science, technology, engineering and mathematics (STEM) education. Prior to joining NSF, Marrongelle was dean of the College of Liberal Arts and Sciences at Portland State University (PSU) and Professor of Mathematics and Statistics, where she oversaw 24 departments and programs across the humanities, social sciences and natural sciences. In addition to her work as dean, Marrongelle has served as a faculty member in the Department of Mathematics and Statistics at PSU since 2001. Prior to her appointment as dean, she held positions as the Vice Chancellor for Academic Strategies and Assistant Vice Chancellor for Academic Standards and Collaboration with the Oregon University System. From 2009 - 2009, Marrongelle served on a rotation as a program officer at NSF and led numerous grants, collaborating with researchers nationally and internationally to improve undergraduate mathematics education and K-12 mathematics professional development. Marrongelle has a bachelor’s degree in mathematics and philosophy from Albright College, a master’s degree in mathematics from Lehigh University and a doctorate in mathematics education from the University of New Hampshire.

Sylvia James, Deputy Assistant Director, NSF DUE

Sylvia M. James is the Deputy Assistant Director of the National Science Foundation’s (NSF) Directorate for Education and Human Resources (EHR), where she oversees aspects of directorate program development, staffing, performance management, and internal and external communications. Prior to her role as Deputy Assistant Director, James served as the Director of the Division of Human Resource Development (HRD). As Division Director, she managed a $148 million budget and a talented team of scientific and administrative staff. During her 17-year tenure at NSF, James has served in numerous capacities, including as the Acting EHR Deputy Assistant Director, Acting Director of HRD, Acting Director and Acting Deputy Division Director of the Division of Research on Learning in Formal and Informal Settings, Lifelong Learning Cluster Coordinator, and Lead Program Director/Program Director for several EHR programs including ISE, ITEST, ATE, ASCEND, and AYS. James currently serves as the Co-Chair of the Federal Coordination in STEM (FC-STEM) Interagency Working Group on Inclusion in STEM (IWSG) and was a member of the Burroughs Wellcome Fund, Student Science Enrichment Program Advisory Committee from 2012-2016. She has served as an education consultant for science education radio, youth publications, and museums and an adjunct science faculty member. James holds a BS in Biology from Loyola University, an MS from Johns Hopkins University, and a PhD in Science Education from Morgan State University.

Robin Wright, Division Director, DUE, NSF

Robin Wright currently serves as director of the Division for Undergraduate Education. She is at NSF on a temporary assignment from the University of Minnesota’s Department of Biology Teaching and Learning, for which she was the founding head. She previously served as Associate Dean for Faculty and Academic Affairs in the College of Biological Sciences and as professor of Genetics, Cell Biology, and Development.
Prior to focusing exclusively on undergraduate education research and development, her lab used genetic, cell biological, ecological, and evolutionary approaches to explore cold adaptation, using baker’s yeast as a model organism. Her laboratory was known as a great place for undergraduates to pursue research, and she has mentored nearly 100 undergraduate researchers over the past 27 years. At Minnesota, she helped to develop and co-teaches the Nature of Life orientation program and has been a leader in development of Foundations of Biology, an innovative, team-based introductory biology course for biological sciences majors. She has led HHMI- and NSF-supported initiatives to deliver discovery-based research experience to the thousands of majors and non-majors who take biology classes in the College of Biological Sciences each year. Wright served on the Education Committee of the American Society for Cell Biology and as chair of the Education Committee for the Genetics Society of America. She was a senior editor of Life Science Education and is the founding Editor-in-Chief of a new biology curriculum journal called CourseSource. She was a member of the Executive Committee for the HHMI/National Academies of Science-sponsored Summer Institute on Biology Education and the National Academies Scientific Teaching Alliance. During this work, she was named as a National Academies Biology Education Mentor for fourteen consecutive years. She was elected as a fellow of the American Association for the Advancement of Science and has received the Elizabeth Jones Award for Excellence in Undergraduate Education from the Genetics Society of America.

Lee L. Zia, Deputy Division Director, NSF DUE

Lee Zia is the Deputy Division Director for DUE. He served as the Lead Program Director for the NSF National Science, Mathematics, Engineering, and Technology Education Digital Library (NSDL) Program from its inception in FY 2000 to its sunsetting in FY 2010. He served as a “rotator” in the NSF Division of Undergraduate Education during calendar years 1995 and 1996 while on leave from the Department of Mathematics at the University of New Hampshire. Zia rejoined the NSF as a permanent staff member in the fall of 1999. From November 2008 to December 2009, he served as a Commerce Science and Technology Fellow in the Office of Senator John D. Rockefeller IV. Most recently he served as the Lead Program Director for the STEM Talent Expansion Program (STEP). Zia holds degrees in mathematics from the University of North Carolina (BS) and the University of Michigan (MS), and applied mathematics from Brown University (PhD).

AAAS Leadership

Alan I. Leshner, Interim CEO and Executive Publisher, Science Family of Journals, AAAS

Alan I. Leshner was appointed Interim Chief Executive Officer of the American Association for the Advancement of Science (AAAS) in July 2019. He previously served as AAAS CEO and Executive Publisher of the Science family of journals from 2001 to 2015, when he became CEO Emeritus. Before coming to AAAS, Leshner was Director of the National Institute on Drug Abuse (NIDA) from 1994 to 2001, preceded by a term as Deputy Director and Acting Director of the National Institute of Mental Health (NIMH). He went to NIMH from the National Science Foundation (NSF), where he held a variety of senior positions focusing on basic research in the biological, behavioral and social sciences, science policy, and science education. Leshner spent 10 years at Bucknell University, where he was Professor of Psychology and also held long-term appointments at the Wisconsin Regional Primate Research Center and as a Fulbright Scholar at the Weizmann Institute of Science in Israel. He is the author of a textbook on the relationship between hormones and behavior and has published extensively for both the scientific and lay communities on the biology of behavior, science and technology policy, science education, and public engagement with science. Leshner received an undergraduate degree in psychology from Franklin and Marshall College, and MS and PhD degrees in physiological psychology from Rutgers University. He also has been awarded seven honorary Doctor of Science degrees. He is an elected fellow of AAAS, the National Academy of Public Administration, the American Academy of Arts and Sciences, and many other professional societies. He is a member of the National Academy of Medicine (formerly the Institute of Medicine) of the National Academies of Sciences, Engineering and Medicine, and served two terms on its governing Council. He was appointed to the National Science Board by President Bush in 2004 and reappointed by President Obama in 2010.

Shirley Malcom, Senior Advisor, and Director of Sea Change, AAAS

Shirley Malcom is Senior Advisor and Director of SEA Change at AAAS. She has served as a program officer in the NSF Science Education Directorate; an assistant professor of biology at the University of North Carolina, Wilmington; and a high school science teacher. Malcom received her PhD in Ecology from the Pennsylvania State University; Master’s in Zoology from the University of California, Los Angeles; and Bachelor’s with distinction in Zoology from the University of
Maureen Kearney, Chief Program Officer, AAAS

Maureen Kearney, Chief Program Officer, joined AAAS in February 2018. Kearney brings an extensive mix of academic, management and public engagement experience to the Association. Prior to joining AAAS, she served as Associate Director for Science at the Smithsonian Institution’s National Museum of Natural History. Before that, she served as Program Director and Acting Division Director in the Division of Environmental Biology at the National Science Foundation. Previously, she worked as a research curator at the Field Museum of Natural History and a member of the Committee of Evolutionary Biology at the University of Chicago. She received her PhD in Biological Sciences, with a research focus on phylogenetics, evolution and biodiversity science from George Washington University. As the Chief Program Officer at AAAS, Kearney oversees programs such as Science and Technology Fellowships; Scientific Responsibility, Human Rights & Law; Science Diplomacy; STEM Education; Diversity, Equity, & Inclusion, and Dialogue on Science, Ethics and Religion.

Se Kim, Deputy Chief Program Officer, AAAS

A biologist by training, Kim’s research focused on the role of epigenetics in neuroscience and plant biology with publications in journals including Development, Journal of Neuroscience, Current Biology, and Plant Cell. She holds a BS in biochemistry from the University of Texas at Austin and a PhD in molecular and human genetics from Baylor College of Medicine. She continued her research at Rice University as a National Institute of Health NRSA postdoctoral fellow. Kim also has an MBA from the Robert H. Smith School of Business at the University of Maryland. She demonstrates a deep commitment to and experience in bridging scientific and religious communities through constructive dialogue and education.
BIOGRAPHIES

S-STEM Symposium Planning Staff

Iris R. Wagstaff, S-STEM PI and Symposium Lead, STEM Program Director, AAAS

Iris R. Wagstaff is a scientist, educator, mentor, researcher and STEM advocate. She currently serves as a STEM Program Director in the Diversity, Equity, and Inclusion Department of AAAS where she manages programs at the undergraduate, graduate, and postdoctoral levels focused on broadening participation in STEM and workforce development. She served as a 2015-2017 AAAS Science and Technology Policy Fellow at the DOJ National Institute of Justice Office where she led an agency-wide diversity and inclusion initiative. She is a native of Goldsboro, NC with a BS and MS in Chemistry from UNC-Greensboro and NC A&T State Universities respectively; and a PhD in Science Education from North Carolina State University. She worked as a research chemist at the Dow Chemical Company for 15 years where she led analytical project teams and company-wide diversity initiatives. She has over 20 years of STEM outreach and advocacy developing informal science programs, mentoring, resourcing parents, facilitating professional development for K-12 science teachers, and building strategic partnerships between industry, academia, and community organizations.

Wagstaff is also a social scientist with a research focus on examining factors that predict science self-efficacy, science identity, and STEM career intent in high school students and underrepresented/underserved youth populations. She serves on the Boards of several organizations that include the National Organization of Black Chemists and Chemical Engineers (NOBCChE), the Chemical Society of Washington (CSW), and Science, Engineering, and Math Links (SEM). She is an adjunct chemistry professor at UNC-Greensboro where she leads diversity and inclusion efforts to broaden participation in the chemical sciences. She has received several honors that include the 2019 DC Metro HBCU Alumni Alliance Award for Education, the 2019 AERA Science Teaching and Learning Research Award, the 2019 BEYA Science Spectrum Trailblazer Award, the 2018 NOBCChE Presidential Award for Mentoring, the 2017 Women of Color in STEM K-12 Promotion of Education Award, and a 2016 nomination for the NSF Presidential Award for Excellence in Science, Math, Engineering Mentoring (PAESMEM).

David Brown, Professor of Chemistry, Southwestern College

For more than 25 years, David R. Brown has focused his professional efforts on broadening the participation of students underrepresented in the STEM enterprise. He is a faculty member in the Department of Chemistry at Southwestern College, one of the 115 California community colleges, situated 8 miles north of the U.S.-Mexico international border in Chula Vista, CA. A native of the Mississippi River Valley region of southern Illinois, Brown holds a B.A. in Chemistry from Southern Illinois University Edwardsville, earned a PhD in Physical Chemistry from the University of Illinois at Urbana-Champaign and undertook postdoctoral research at the University of California, San Diego. David has been a Principal Investigator on several National Science Foundation (NSF) grants that have supported projects in curriculum and program development, faculty professional development, science outreach to the public and undergraduate research.

From August of 2012 through August of 2015, Brown served as a Program Director in the Division of Undergraduate Education at the NSF. While at NSF his activities included serving as Co-Lead Program Director on the Advanced Technological Education (ATE) program, and he enjoyed assignments on the Improving Undergraduate STEM Education (IUSE), the NSF Scholarships in STEM (S-STEM) and the National Nanotechnology Coordinated Infrastructure (NNCI) programs, while also participating in various committees and working groups.

In 2007 his efforts to broaden participation in STEM were honored with the Stanley C. Israel Award for Advancing Diversity in the Chemical Sciences from the American Chemical Society Western Region, and in 2012 Brown received the Award for Incorporating Sustainability into Chemistry Education from the American Chemical Society Committee on Environmental Improvement.

Kelly Mack, Vice President for Undergraduate STEM Education and Director of Project Kaleidoscope, Association of American Colleges and Universities (AAC&U)

Prior to joining AAC&U, Mack was the Senior Program Director for the National Science Foundation (NSF) ADVANCE Program while on loan from the University of Maryland Eastern Shore (UMES) where, as a Professor of Biology, she taught courses in Physiology and Endocrinology for 17 years.
Mack earned the BS degree in Biology from UMES and the PhD degree from Howard University in Physiology. She has had extensive training and experience in the area of cancer research with her research efforts focusing primarily on the use of novel antitumor agents in breast tumor cells. Most recently, her research focus has involved the use of bioflavonoids in the regulation of estrogen receptor positive (ER+) and estrogen receptor negative (ER-) breast tumor cell proliferation. Mack has served as a member of the Board of Governors for the National Council on Undergraduate Research and is a current member of the National Institutes of Health Review Subcommittee for Training, Workforce Development and Diversity. She also recently completed a brief stint as Executive Secretary for the NSF Committee on Equal Opportunities in Science and Engineering, which is the Congressionally mandated advisory body that focuses on efforts to broaden the participation of underrepresented groups in the STEM disciplines.

Yvette Pearson, Associate Dean for Accreditation, Assessment, and Strategic Initiatives, Rice University

Yvette E. Pearson is Associate Dean for Accreditation, Assessment, and Strategic Initiatives in the George R. Brown School of Engineering at Rice University. A Fellow of the American Society of Civil Engineers (ASCE), she is recognized for more than two decades of contributions to engineering education focused largely on students from excluded identities in STEM.

Prior to joining Rice, Pearson was a program director in the Division of Undergraduate Education at the National Science Foundation where she was co-lead of the Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM) program. She has been PI on multiple S-STEM projects, including a workshop grant that supports proposal development for faculty at predominantly undergraduate and/or minority-serving institutions, emphasizing those in Established Program to Stimulate Competitive Research (EPSCoR) jurisdictions. In 2017, she founded The Pearson Evaluation and Education Research Group, which serves as a consultant on STEM education projects. Among Pearson’s awards and honors are ASCE’s Professional Practice Ethics and Leadership Award, University of Texas Regents’ Outstanding Teaching Award, UT Arlington’s Provost’s Award for Excellence in Teaching, and recognition as one of the Top 25 Women Professors in Texas.

Pearson holds a BS in civil engineering and MS in chemistry from Southern University, a PhD in engineering and applied science from The University of New Orleans, and a Graduate Certificate in educational research methodology from the University of Illinois at Chicago. She is a registered Professional Engineer in Louisiana and a Program Evaluator for the Engineering Accreditation Commission of ABET.

Ivory Toldson, President and CEO, Quality Education for Minorities (QEM)

Ivory A. Toldson is the president and CEO of the QEM Network, professor of counseling psychology at Howard University, editor-in-chief of The Journal of Negro Education and executive editor of the Journal for Policy Analysis and Research, published by the Congressional Black Caucus Foundation, Inc. Previously, Toldson was appointed by President Barack Obama to devise national strategies to sustain and expand federal support to HBCUs, as the executive director of the White House Initiative on Historically Black Colleges and Universities. Since 2016, as QEM principal investigator, Toldson has been awarded more than $4.5 million from federal agencies including NSF and NASA, to support capacity building efforts for STEM programs at Minority Serving Institutions.

Kate Winter, Evaluator, Kate Winter Evaluation

Kate Winter leads the team at Kate Winter Evaluation, LLC (KWE), which is conducting the external evaluation of the AAAS Supporting Low Income Students in STEM Education and Workforce project. KWE is currently the external evaluator for several NSF-funded initiatives to broaden participation in STEM, as well as two five-year-long consortia-based projects funded by the U.S. Dept. of Education and an NIH IPERT grant. Winter has worked with major NSF initiatives (e.g., ADVANCE, HBCU-UP, S STEM) since 2003. She is an accomplished external evaluator and higher education researcher with over 15 years of experience and expertise in: policy and program development and assessment; leadership and leadership development; teaching and learning; student access, retention, and success; diversity in academic STEM; faculty development; and, faculty productivity and satisfaction. She has presented research findings and policy recommendations nationally and internationally, published numerous journal articles, and authored or co-authored book chapters on teaching and learning, efforts to support faculty, and strategies for broadening participation in STEM.

Winter is a member of the American Evaluation Association (AEA) and other national and international research societies. She is a WWC certified reviewer for group designs. She teaches research methods courses in Creighton University's Doctoral
Karen Wosczyna-Birch, State Director, CT College of Technology; Executive Director & Principal Investigator, Regional Center for Next Generation Manufacturing, USA

Karen Wosczyna-Birch has been a champion of engaging women in nontraditional careers that include engineering and technology education for the past 30 years. Since 1995, she has been the state director of the CT College of Technology where through her leadership, she has been instrumental in creating a nationally recognized seamless pathway in engineering and technology programs between all 12 public community colleges in Connecticut with eight universities and over 30 high schools. She is also the Executive Director of the Regional Center for Next Generation Manufacturing, a National Science Foundation Center of Excellence and a Professor at Tunxis Community College.

She serves on numerous boards including the International Honor Society EPT, the National Coalition of Advanced Technology Center, and Hartford High’s Academy of Engineering and Green Technology. In 2014, she was invited to the White House College Opportunity Summit where educators across the U.S. were recognized for their dedication and commitment to educating the future workforce.
NSF S-STEM Program Staff

Keith Sverdrup, Program Lead

Keith Sverdrup received his Bachelor of Science degree in Geophysics from the University of Minnesota and his PhD in Geosience from the Scripps Institution of Oceanography at the University of California-San Diego where he participated in multiple research cruises throughout the Pacific Ocean basin. He was on the faculty of the University of Wisconsin-Milwaukee (UWM) for 36 years as Professor of Geophysics (seismology). Keith served as a program officer at NSF for six years while at UWM. After retiring from UWM he returned to NSF EHR/DUE where he is the lead program officer for the S-STEM program. Keith is the author of three introductory oceanography textbooks and 60 papers and abstracts on seismology and tectonics. He is a life member of the American Geophysical Union and a Fellow of the Geological Society of America.

Stephanie August, Program Director

Stephanie August is a program director in NSF’s Division of Undergraduate Education and a professor of computer science at Loyola Marymount University (LMU) in Los Angeles. She is an active member of the working group for the Future of Work at the Human Technology Frontier. She has served as department director of graduate studies and special assistant to the chief academic officer for graduate studies at LMU. Previously she was a staff engineer at Hughes Aircraft Company. Stephanie is interested in the online interactive digital and virtual learning environments, infusing other disciplines with computing concepts, and understanding how STEM education will evolve in the coming years. She received her B.A. in Slavic Languages and MS and PhD in Computer Science from the University of California, Los Angeles.

Jack Butler, Science Analyst/Science Assistant

Jack Butler is a Science Education Analyst/Science Assistant in the Division of Undergraduate Education. He is a member of the outreach and communications teams for the Directorate of Education and Human Resources and provides data support to the Robert Noyce Teacher Fellowship and Improving Undergraduate STEM Education Programs. Jack received his Bachelor of Science from Brown University with a dual concentration in Physics and Linguistics.

Connie Kubo Della-Piana, Program Director

Connie Kubo Della-Piana, PhD is a program director in the Division of Undergraduate Education (DUE). Her current program assignments include the Scholarships in STEM program, the Advanced Technological Education program (research track), and the EHR: Improving Undergraduate STEM Education program (Social Sciences, EHR: IUSE Engaged Student Learning and Institutional and Community Transformation). She is currently the lead program director for the STEM Talent Expansion Program, that includes the special funding focus, Graduate 10K+, an Intel and GE Foundation effort. Her areas of expertise are in evaluation and organizational communication. Before coming to DUE, she worked in the NSF Office of Integrative Activities with responsibilities for program evaluation.

Thomas B. Higgins, Program Director

Thomas B. Higgins is currently serving as a Program Director in the Division of Undergraduate Education (DUE) within the Directorate of Education and Human Resources (EHR) at the National Science Foundation (NSF). He has managed projects in five DUE programs: Advanced Technological Education (ATE), Improving Undergraduate STEM Education (IUSE), Robert Noyce Teacher Scholarships, Research Experiences for Undergraduates (REU), and Scholarships in STEM (S-STEM).

Higgins is also a Professor of Chemistry at Harold Washington College of the City Colleges of Chicago (CCC). CCC is an urban community college district that provides affordable and accessible academic and career and technical education for the nation’s third largest city. Higgins has been a full-time faculty member at CCC for 21 years. He has served as the Chair of the multi-disciplinary Department of Physical Sciences, has won the college’s Distinguished Professor award, and has been a pioneer in providing authentic undergraduate research opportunities to community college students. His work has been funded by the NSF, NASA, and the Department of Defense. His contributions to the field of chemistry were recognized by the American Chemical Society (ACS) in 2016, when he was declared an ACS Fellow.
BIOGRAPHIES

Abby Ilumoka, Program Director

Abby Ilumoka received the Bachelor of Science degree in Physics and Chemistry from the University of Aston in Birmingham, England in 1976, the Master of Science degree in Electronics from the University of Southampton, England in 1978 and the PhD in electrical engineering from Imperial College London, England in 1982. Following this, she continued with postdoctoral work at Imperial College and later lectured at Brunel University, Uxbridge, UK. International work experience was further enriched in Nigeria (her country of birth) at Telecommunications Consulting and Services Inc., Lagos and the University of Ilorin, Nigeria.

In 1992, she joined the faculty at the College of Engineering, University of Hartford in Connecticut, where she taught for 23 years. Her research interests have ranged from engineering education to microelectronic circuit optimization and artificial intelligence-based complex adaptive systems design. She has authored 80 journal publications and conference articles and received research and teaching grants from government and corporate sources rising to the rank of full professor in 2003. In 2007, she received the Connecticut Women of Innovation Award for outstanding leadership and technology innovation. In 2008, Ilumoka successfully founded the University of Hartford STEM UP! Program – a comprehensive pre-college STEM immersion program designed to identify strategies that overcome barriers to women and underrepresented minorities in engineering. She was later honored by the Connecticut Women’s Hall of Fame as “one of the best of A New Century of Women in Science” for her leadership efforts to mentor young women and minorities in Connecticut. As one of the state’s most distinguished engineers, she was inducted into the Connecticut Academy of Science and Engineering (CASE) the prestigious non-profit that provides science and technology advice to state government and the Connecticut General Assembly.

Abby currently serves as program director for engineering education in the Division of Undergraduate Education (DUE) at NSF and has worked on all four DUE programs – ATE, IUSE, NOYCE and S-STEM. She manages the Department of Defense-funded ASSURE portfolio of the foundation-wide NSF Research Experiences for Undergraduates program. Ilumoka leverages her knowledge of and expertise in complex systems research for effective and efficient management of the undergraduate STEM/engineering education portfolio.

Rupa Iyer, Program Director

Rupa Iyer is a Program Director at the National Science Foundation in the Division of Undergraduate Education. Iyer is also a Professor of Engineering Technology at the University of Houston (UH), and the Founding Director of Biotechnology Programs. In this capacity she has created, designed, and implemented an interdisciplinary, research-based biotechnology degree program with funding from the NSF, NIST, and TWC. She was the Associate Dean of Research and Graduate Studies for the College of Technology at UH before she began her rotation at NSF as a Program Director in DUE in 2017. She was a Fulbright Specialist to Morocco, 2016, recipient of UH’s Excellence in Teaching award, and UH’s Distinguished Leadership in Teaching Award.

The focus of Iyer’s research is in bacterial exposure and adaptation to xenobiotic compounds, and its implications and applications in environmental biotechnology. She has integrated her disciplinary research and evidence based and evidence generating approach to improving STEM education by designing undergraduate research in environmental sampling of bacterial xenobiotic degrading activity in soil and water. The undergraduate research module is currently implemented at 5 diverse institutions to broaden participation, provide access to research experiences to undergraduates, and enhance STEM skills. The approach provides a global platform to address and solve problems in environmental contamination and as well as STEM education in a very cost-effective way.

Andrea Johnson, Program Director

Andrea Johnson joined the National Science Foundation in 2014 as a program director in the Division of Human Resource Development (HRD) in the Directorate of Education and Human Resources (EHR). She co-managed the Historically Black Colleges and Universities Undergraduate Program (HBCU-UP), the Centers of Research Excellence in Science and Technology (CREST) program and the Hispanic-Serving Institutions (HSI) Program. She currently serves as a program director in the Division of Undergraduate Education where she co-leads the S-STEM program and supports the Advanced Technological Education (ATE) program and the Improving Undergraduate STEM Education: Education and Human Resources (IUSE: EHR). Prior to coming to NSF, she was a Research Assistant Professor in the NOAA Living Marine Resources Cooperative Science Center (LMRSC) at the University of Maryland Eastern Shore (UMES). There, she conducted research on the physiology, reproductive biology and life history of marine and estuarine fish species.
During her tenure at UMES, she served as the Associate Director for the National Science Foundation’s CREST Center for the Integrated Study of Coastal Ecosystem Processes and Dynamics in the Mid-Atlantic Region. Johnson obtained her BS degree in Marine Science from the University of Miami, her MS in Marine Science from the University of South Florida and her PhD in Comparative Biomedical Sciences at the North Carolina State University College of Veterinary Medicine.

Karen Keene, Program Director

Karen Keene is an associate professor of mathematics education at North Carolina State University serving as a rotating program director at the National Science Foundation. She taught high school for 15 years before she became a mathematics instructor at the university level. Her interest in the teaching and learning of mathematics led to her pursuing a PhD in mathematics education at Purdue University, graduating in 2006. Her research areas involve mathematics teacher preparation, undergraduate mathematics education, and instructional change at the university level in STEM courses.

Jennifer Lewis, Program Director

Jennifer Lewis is a Program Director from the University of South Florida, Tampa, FL, where she is a Professor in the Department of Chemistry. She identifies as a discipline-based educational researcher and has published work on argumentation, affect, and measurement. Her current projects include social network analyses of faculty involved in institutional change efforts. Jennifer brings her expertise as an experienced project evaluator to the S-STEM Program.

Alexandra Medina-Borja, Program Director

Alexandra Medina-Borja has been at the National Science Foundation (NSF) since 2012 where she has served in multiple roles. First as program director in the Directorate for Engineering where she became responsible for the entire portfolio of the Partnerships for Innovation in Smart Service Systems program within the Division of Industrial Innovation and Partnerships and currently as a Program Director in the Engineering Cluster of the Division of Undergraduate Education, where she has served as a co-Lead for the S-STEM program since 2018. She also acts as the Executive Secretary of the Advisory Committee’s subcommittee on the STEM Education of the Future and together with colleagues in different STEM disciplines, oversees the coordination of the STEM Education 2026 and Beyond symposium to discuss the future of undergraduate education. In addition, Alexandra is one of the program officers assigned to the NSF-wide working group developing the Future of Work and the Human Technology Frontier research theme, one of NSF’s ten ideas for future NSF investment. This new initiative will advance the frontiers of Human-Technology interactions so that new smart technologies are partnering with people, as opposed to replacing them in work environments.

Alexandra earned her PhD and master’s degrees from the Virginia Tech’s Industrial and Systems Engineering Department, and a Production Engineering Degree with a Materials concentration from the Federal University of São Carlos in São Paulo, Brazil. In April of 2017, Medina-Borja was inducted to the Virginia Tech’s Academy of Distinguished Industrial and Systems Engineering Alumni.

Andrea Lisa Nixon, Program Director

Andrea Lisa Nixon currently serves as a Program Director in the Division of Undergraduate Education and Co-Lead for the Improving Undergraduate STEM Education (IUSE) Program. Nixon received her PhD from the University of Minnesota and is an educational researcher with experience in institutional transformation, cyber learning, mixed-methods research, longitudinal data analysis, and meta analysis. Her home institution is Carleton College, a residential liberal-arts college in Minnesota, where she is the Director of Educational Research where among other projects she conducted a longitudinal study of students’ curricular help-seeking behaviors. Nixon was a founding director of the Liberal Arts Consortium for Online Learning (LACOL), served as an invited expert to President Obama’s Council of Advisors on Science and Technology (PCAST), and external advisor to MIT’s Online Education Policy Initiative.

Mark Pauley, Program Director

Mark Pauley received a BS in chemistry from the University of Florida, an MS in chemistry from the University of North Carolina at Chapel Hill, and a PhD in physical chemistry from the University of Nebraska—Lincoln. He is a program director in the Division of Undergraduate Education where he works on the IUSE and Noyce programs in addition to S-STEM. He is also a co-lead on the Research Coordination Networks in Undergraduate Biology Education program, a joint program between the Divisions of
Undergraduate Education and Biological Infrastructure. His teaching and research interests center around bioinformatics and bioinformatics education.

**Pushpa Ramakrishna, Program Director**

Pushpa Ramakrishna is a program director in the Division of Undergraduate Education in the Education and Human Resources Directorate at the National Science Foundation. At NSF, she serves as program director for the S-STEM Scholarship program, Advanced Technological Education (ATE) program, and the Improving Undergraduate STEM education (IUSE) programs. She is also involved in the HSI program and the STEM education 2026 initiative at the Division of Undergraduate Education. She is interested in studying the incorporation of convergent or interdisciplinary education into the undergraduate curriculum with a focus on sustainability. She is passionate about igniting students interests in sustainability and the STEM fields. Prior to NSF, she was the founder and chair of the Sustainability Instructional Council for Maricopa Community Colleges in Arizona, the co-chair of the Maricopa Sustainability Committee, and she also directed the Biomedical Research Technology Program at Chandler Gilbert Community College (one of the Maricopa Community Colleges). She won the ‘Maricopa Outstanding Employee of the Year’ and over the years, she won the "Innovation of the Year" team award multiple times for sustainability education, service learning, revitalizing the science curriculum and for student learning and outcome assessment. She has a doctorate degree in Sustainability Education and a master’s degree in molecular and Cellular Biology from Arizona State University.

**Sami Rollins, Program Director**

Sami Rollins currently works as a rotating Program Director in the Division of Undergraduate Education at the National Science Foundation. She is also a Professor of Computer Science at the University of San Francisco where she teaches courses on software development and distributed computing. Her research interests include computer science education and mobile computing systems. She is also passionate about broadening participation in computing and STEM fields. She previously served as co-chair of the board of Networking Women and co-editor of the education column for Get Mobile Magazine. She earned a BA degree from Mills College and MS and PhD degrees from the University of California at Santa Barbara.

**Michael M. Rook, Science Analyst**

Michael M. Rook is a learning scientist, design enthusiast, and developer of technologies/tools to support pedagogical practices and data science. Michael serves as Science Analyst in the Division of Undergraduate Education (DUE) within the Directorate for Education and Human Resources at the National Science Foundation (NSF), where he supports the merit review process and conducts scientific analyses of proposals. In addition, Michael periodically serves as guest lecturer at Georgetown University in the Masters of Learning and Design program, and he continues a research agenda focused on the role of innovative learning spaces in the teaching and learning process.

Michael has served as AAAS Science and Technology Policy Fellow within NSF in the Office of International Science and Engineering, and in the Division of Research on Learning in Formal and Informal Settings. Before NSF, Michael held numerous research and teaching positions including researcher for the Krause Innovation Studio at the Pennsylvania State University (PSU), undergraduate- and masters-level instructor of educational technology, multimedia, learning design studio, and disruptive technologies in teaching and learning at PSU, academic counselor and instructor at Saint Francis University, K-8th grade music teacher at Saint Michael School in PA, and student teacher of computer programming, algebra, and discrete mathematics at Nottingham High School in NJ. Michael holds a PhD in Learning, Design, and Technology from the Pennsylvania State University, a Master of Arts in Teaching (M.A.T.) in Secondary Education and Mathematics from the College of New Jersey (TCNJ), and a BS in Computer Science from TCNJ.

**Steven Turley, Program Director**

Steven (Steve) Turley is a temporary program director for physics education in the Division of Undergraduate Education (DUE) at the National Science Foundation. Turley is involved in the Improving Undergraduate STEM Education (IUSE); the Robert Noyce Scholarship; the IUSE: Hispanic Serving Institutions (IUSE:HSI); Scholarship in Science, Technology, Engineering, and Mathematics (S-STEM), Midsize Infrastructure (Midsize RI-1), and ECR: Production Engineering Education and Research (ECR: PEER) programs.

Turley received a BS in physics from Brigham Young University in 1978. He did his graduate work at M.I.T. in Physics where he received a PhD in physics where he was supported by a Howard...
Hughes Fellowship. During and following his education, Turley worked at Hughes Aircraft Company in their Missile Systems Division and later at Hughes Research Labs.

Turley’s permanent institution is Brigham Young University (BYU) where he is a Professor of Physics. At BYU he has also been an Associate Dean and Department Chair. Before coming to NSF, Turley was on the Leadership Team of the national Physics New Faculty Workshop and the Treasurer of the American Association of Physics Teachers.

Turley’s current research interests are in STEM faculty development, extreme ultraviolet optics, and computational electromagnetics. Previous research projects have been in the areas of nonlinear optics, atomic physics, laser cooling, plasma diagnostics, nuclear physics, and planetary physics. He is a Fellow of the American Association of Physics Teachers and the Utah Academy of Sciences, Arts and Letters.

Glenda Valdez, Science Assistant/Science Education Analyst

Glenda Valdez is a Science Assistant/Science Education Analyst in the Division of Undergraduate Education. Within DUE she works closely with Scholarships in STEM and the Advanced Technical Education Programs and within the Directorate of Education and Human Resources she works with the Hispanic-Serving Institutions Program, the communications team, and the outreach committee. She also is a co-chair for the Science Assistant Community of Practice. Glenda received her Bachelor of Science from the University of Wisconsin-Madison with a double major in Entomology and Applied Economics and certificates in Environmental Studies and Leadership.
BIOGRAPHIES

S-STEM Symposium Speakers

Kamau Bobb, Senior Director, Constellations Center for Equity in Computing, Georgia Tech

Kamau Bobb is a national authority in STEM education. He is the founding Senior Director of the Constellations Center for Equity in Computing at Georgia Tech. Bobb is an engineer and science and technology policy scholar whose work focuses on the relationship between equity for students and communities of color in the STEM enterprise, large educational systems, and the social and structural conditions that influence contemporary American life.

Steve Bumbaugh, Senior VP, College and Career Success, College Board

Steve leads work to ensure students access and maximize college and career opportunities. As head of the College and Career Access division, Steve oversees enrollment and financial aid programs including CSS/Financial Aid PROFILE®, Student Search Service®, the Access to Opportunity™ initiative, and scholarship programs. Additionally, he oversees the partnership with Khan Academy to provide free, high quality SAT preparation for students, as well as the partnership with the Chan Zuckerberg Initiative. These efforts are designed to increase college readiness and college completion for all students, with a special focus on lower-income students, first-generation college students, and students of color.

Bianca Chavis, Undergraduate Student, Indiana University-Purdue University Indianapolis (IUPUI)

Bianca Chavis completed her associate’s degree in informatics from Ivy Tech Community College and will pursue her bachelor’s degree in informatics in fall 2019 at IUPUI. She began her higher education journey in spring 2014 at IUPUI but left to work full-time. In spring 2017, she connected with an advisor at Ivy Tech and found her new home in informatics. Chavis currently holds a 4.0 GPA at Ivy Tech, and even before joining the S-STEM project at IUPUI, she engaged in internship opportunities to support her career goals. She has been a Business Analyst Intern at Sondhi Solutions, a Database Analysis Intern at the Indiana Office of Technology, and currently serves as an IT Application Support Intern at Ivy Tech. In summer 2019, Chavis served as a Software Development Intern at Launch Indy. She is thankful for programs like the IUPUI S-STEM project and Indy Women of Tech, which support underrepresented students in informatics—allowing her to “see” herself in the field. She is committed to supporting underrepresented minorities in technology as well as future S-STEM recipients. Chavis will serve as a peer mentor for the IUPUI S-STEM project.

Abigail Derton, Undergraduate Student, University of Texas Arlington

Abigail Derton is a senior at the University of Texas at Arlington (UTA) studying pure mathematics. She is a Cherokee Indian, homeschooled in Corinth, TX. She joined UTA as a transfer student after studying civil engineering for two years at North Central Texas College (NCTC). Through working as a math tutor at both NCTC and UTA, Derton grew her passion for mathematics. This passion persuaded her to change majors from civil engineering to pure mathematics in the Fall of 2017. She has participated in the S-STEM program at UTA (called SURGE) since the Fall of 2018. She’s an active member of the Mathematics Association of America, attending the Field of Dreams Conference in 2018 where she developed an interest in mathematical biology. She is a researcher in the Undergraduate Research Opportunity Program (UROP), currently working on a project in computational neuroscience. In summer 2019 Derton participated in the Biostatistics and Computational Biology Summer Research Program at Harvard. Her goal is to utilize her mathematical skills to progress medical understanding and thereby save and improve countless lives.

Nicholas DiTommaso, Undergraduate Student, Michigan State University

Nicholas DiTommaso is studying Chemical Engineering and Economics at Michigan State University (MSU). He has been a researcher at Beaumont Hospital, the MSU chemistry department, and the University of Pittsburgh in conjunction with the Veterans Administration. DiTommaso has worked as a National Science Foundation REU researcher. He is also a member of the MSU Honors College, through which he volunteers in both the Lansing and East Lansing communities, providing tutoring and mentorship to at-risk high school students. He also represents the MSU College of Engineering as a Peer Leader, helping freshmen adjust to college life and become engaged with professional resources. DiTommaso is always looking for ways to get involved on campus. Having seen firsthand the impact of
quality mentoring, he aims to serve as a resource for younger students. In his free time, he is an avid reader and advocate for a variety of causes. Having been born with a rare genetic disorder, he works with a national society of patient advocates for others with the disorder. He has advocated to members of the Senate and House of Representatives on various legislative policies ranging from research funding to newborn screening.

Wilbert Ferdinand Jr., Risk Management Advisor, ExxonMobil (retired)

Wilbert J. Ferdinand, Jr. recently retired from ExxonMobil as Risk Management Advisor at the Baton Rouge Refinery. Over the course of the past three decades, he served in numerous capacities focused on recruitment and development opportunities for underrepresented students in STEM disciplines. For several years he served as Team Captain for ExxonMobil’s Southern University Engineering Recruiting Team and coordinated field trips for K-12 students to visit ExxonMobil facilities to improve their awareness of and foster interest in STEM career opportunities. He served as an industry advisor for Southern University’s NSF-funded HBCU-UP program. Ferdinand continues to serve as a member of Southern University’s Business and Industry Cluster where he conducts interview skills workshops; serves as a guest speaker; and provides input into curriculum development and modifications. For the past three years he has served as a consultant and presenter on Rice University’s Capacity Building for Competitive S-STEM Proposals project, which is funded by NSF. More recently, he joined the advisory and presentation team for a similar project focused on two-year colleges in the western United States. Ferdinand is an experienced NSF reviewer who has lent his expertise to evaluate workforce development components of proposals to various programs over the past five years.

Sara Goldrick-Rab, Professor of Higher Education Policy and Sociology, Temple University; Founder, The Hope Center for College, Community, and Justice in Philadelphia and the Wisconsin HOPE Lab

In more than a dozen experimental, longitudinal, and mixed-methods studies, Goldrick-Rab has examined the efficacy and distributional implications of financial aid policies, welfare reform, transfer practices, and a range of interventions aimed at increasing college attainment among marginalized populations. She is best known for her innovative research on food and housing insecurity in higher education, having led the four largest national studies on the subject, and for her work on making public higher education free. She received the American Educational Research Association Early Career Award in 2014 and the 2018 Grawemeyer Award for Education.

Dan Greenstein, Chancellor, Pennsylvania State System of Higher Education

Dan Greenstein became the fifth chancellor of Pennsylvania’s State System of Higher Education in September 2018. In that role, he serves as chief executive officer of the State System, which operates Pennsylvania’s 14 public universities, serving more than 100,000 students. The chancellor works with the Board of Governors to recommend and develop overall policies for the System. Greenstein previously led the Postsecondary Success strategy at the Bill and Melinda Gates Foundation, where he worked with other higher education leaders across the country on initiatives designed to raise educational-attainment levels and to promote economic mobility, especially among low-income and minority students. He developed and implemented a national strategy for increasing the number of degrees awarded and for reducing the attainment gaps among majority and non-majority students at U.S. colleges and universities.

David Mattingly, S-STEM Principal Investigator, Assistant Professor, University of New Hampshire

David Mattingly is an assistant professor of physics at the University of New Hampshire (UNH) who primarily studies quantum gravity and black holes. He received his BA from Dartmouth, spent a little time at the University of California Santa Barbara until the beach and sun just got to be too much, and then finished his PhD at the University of Maryland. Besides his physics career, he has worked in software development and as a K-12 educational consultant for Journeys in Film, designing K-12 curricula for Hollywood movies and mini-series, and for brilliant.org, designing engaging physics problems and games for students around the world. His S-STEM work is geared towards assisting thirty students from urban areas in New Hampshire get to and through UNH in a STEM field, with an emphasis on workforce development. As part of this work, he also runs a longitudinal study on the effects of university and high school supports on the students’ academic performance as well as their cognitive and non-cognitive skill sets.
Eduardo J. Padrón, President, Miami Dade College

An American by choice, Eduardo Padrón arrived in the United States as a teenage refugee in 1961. Since 1995, he has served as President of Miami Dade College (MDC), the largest institution of higher education in America with more than 165,000 students. He is credited with elevating MDC into a position of national prominence among the best and most recognized U.S. colleges and universities. An economist by training, Padrón earned his PhD from the University of Florida. In 2016, President Barack Obama awarded him the Presidential Medal of Freedom, the highest civilian honor in the U.S., for being a prominent national voice for access and inclusion in higher education. In 2009, TIME magazine included him on the list of “The 10 Best College Presidents.”

Eve Riskin, S-STEM Principal Investigator, University of Washington

Eve Riskin received her BS degree in Electrical Engineering (EE) from M.I.T. and her graduate degrees in EE from Stanford. Since 1990, she has been in the EE Department at the University of Washington where she is now Associate Dean of Diversity and Access in the College of Engineering, Professor of Electrical and Computer Engineering and Faculty Director of the ADVANCE Center for Institutional Change. Riskin is PI of UW’s successful STARS program. She was awarded a National Science Foundation Young Investigator Award, a Sloan Research Fellowship, and the 2006 Hewlett-Packard Harriet B. Rigas Award. She is a Fellow of the IEEE.

Ivan Santos, Undergraduate Student, Colorado School of Mines

Ivan Santos is a sophomore at the Colorado School of Mines, majoring in computer science. He was born in Aguascalientes, a small state in the center of Mexico. He moved to the United States as a child and grew up in Denver. He found his love for soccer by “having a ball at my feet to isolate myself from the world” and later found his passion for numbers. Math and science were always his strengths in school, and he recognized that the perfect application for both subjects would be in the field of computer science. Ivan says that “hard work” is a never-ending term that he grew up with and is the engine to the success he has experienced throughout his life.

From being the first to graduate high school to the first attending college in his family, he plans to fuel himself with motivation and courage to keep going. As an example for his siblings and family members, he aspires to be the great outcome that generations of his family worked so hard for. He looks forward to meeting new people every day with a smile and an open spot in his ever expanding network.

Judy Staveley, President, Washington Academy of Sciences; Program Manager Contractor, United States Air Force

Judy Staveley is the current President of the Washington Academy of Sciences and a Program Manager contractor for the United States Air Force. Staveley directed the Biotech Processing Program at Frederick Community College (FCC), training students to enter the biotech workforce. In 2016 there were 6 students in the program and in two years the number had grown to 48. Staveley taught forensics and biology for 12 years at FCC, has authored papers on forensic science, is an international speaker, and a professional athlete.

Ardine Williams, Vice President, People Operations, Amazon Worldwide Operations

Ardine Williams is vice president for Amazon Worldwide Operations, leading workforce development for Amazon’s HQ2. Her team delivers programs including Career Choice, which has helped thousands of Amazonians re-train for careers in high demand fields. Previously, Williams was Vice President of Talent Acquisition for Amazon Web Services (AWS), where she scaled the recruiting capability for Amazon’s rapidly growing cloud computing business—including strengthening AWS’ pipeline of military and veteran talent. She has more than 30 years of leadership experience across the tech industry and has held roles in product and corporate business development, venture capital and M&A. Prior to joining Amazon, Williams served as Intel’s Vice President of HR Enterprise Services. She began her career as a commissioned officer in the US Army Signal Corps in 1983.

Rachel Zobel, Graduate Student, University of Pennsylvania

Rachel Zobel is a Master of Environmental Studies candidate with a concentration in Environmental Biology at the University of Pennsylvania. She earned a BS in Biology with minors in Chemistry and Psychology at Gwynedd Mercy where she
was an S-STEM awardee and enthusiastic supporter of the program. Zobel participated in ecological research focusing on macroinvertebrate diversity and stream health as well as studying the metabolic pathways utilized by microbes for plastic degradation. Throughout her time at Gwynedd Mercy and now at University of Pennsylvania, she worked or interned at the Philadelphia Zoo, Pennsylvania House of Representatives, the United States Department of Agriculture, New Jersey Department of Agriculture, and Delaware State Department of Natural Resources and Environmental Control. Currently, her main focus is aquatic biology research. In her free time, she enjoys reading, hiking, community service, and traveling. Her most recent trip was to Puerto Rico to study the effects of natural disasters on ecology around the entire island. Her next trip is to India to study water sanitation in schools.
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